r M. Rooney
Secretary for
Environmental
Protection

Air Resources Board

John D. Dunlap, III, Chairman
P.O. Box 2815 · 2020 L Street · Sacramento, California 95812 · www.arb.ca.gov

Pete Wilson
Governor

MEMORANDUM

TO: Douglas Y. Okumura, Chief
Environmental Monitoring and Pest
Management Branch
Department of Pesticide Regulation

FROM: George Lew, Chief
Engineering and Laboratory Branch
Monitoring and Laboratory Division

DATE: November 16, 1998

SUBJECT: FINAL REPORT FOR THE 1997 ALDICARB AIR MONITORING

Attached is the final "Report for the Application and Ambient Air Monitoring of Aldicarb." The separate volume of appendices for the report has been forwarded to Pam Wales of your staff and are available upon request. As per your October 27, 1998 memorandum, you had no comments on the draft report.

These results are intended for identifying the presence of aldicarb in ambient air. Additional air monitoring near the use of aldicarb may be necessary to determine if there is a need for mitigation. The locations of the ambient monitoring sites and the monitoring period should be evaluated when the 1997 aldicarb use data becomes available.

If you or your staff have questions or need further information, please contact me at (916) 263-1630 or Mr. Kevin Mongar at (916) 263-2063.

Attachment

cc: Ray Menebroker, SSD (w/Attachment and Appendices)
Cosmo Insalaco, Fresno County Agricultural Commissioner (w/Attachment)
David L. Crow, SJVUAPCD (w/Attachment)
Ted Davis, Kern County Agricultural Commissioner (w/Attachment)
Pam Wales, DPR (w/Attachment and Appendices)
Sharon Seidel, OEHHA (w/Attachment)
Shiela Margetich, CDFA Center for Analytical Chemistry (W/Attachment and Appendices)

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

Report for the Application and Ambient Air Monitoring of Aldicarb

Engineering and Laboratory Branch

Monitoring and Laboratory Division

Project No. C97-007(b) (Application)
C97-004(b) (Ambient)

Date: November 16, 1998

Kevin Mongar, Project Engineer

Cynthia L. Castronovo, Manager
Testing Section

George Lew, Chief
Engineering and Laboratory Branch

Summary

Report for the Application and Ambient Air Monitoring of Aldicarb

This report presents the results of application air monitoring for the insecticide aldicarb in Fresno County and ambient air monitoring in Fresno and Kern Counties. Two application studies were conducted in Fresno County. Due to problems with the first study, which was associated with cotton planting, a second study was conducted which was associated with cotton "at first squaring." Ambient monitoring was initially conducted during a three week period from March 24 to April 11, 1997 in Fresno County. The monitoring was scheduled to coincide with cotton planting and the aldicarb samplers were collocated with samplers being used for an ambient phorate air monitoring study. No detectable levels of aldicarb were observed during the first three weeks of monitoring in Fresno County and so the remaining 3 weeks of monitoring was conducted in June in Kern County.

Tables 7 and 8 present the results of application studies #1 and #2 respectively. Tables 9 and 10 present the results of the ambient monitoring studies conducted in Fresno and Kern Counties respectively. Results below the limit of quantitation but equal to or above the limit of detection (LOD) are reported as detected (Det.). Results below the LOD are reported as <LOD. The method development results showed that the parent compound, aldicarb, was partially oxidized to aldicarb sulfoxide and aldicarb sulfone on the resin (degraded during sampling) during the 24 hour sampling at 4 Lpm. Consequently, the LOD and LOQ for the sample results were reported as the combined values for aldicarb and the degradation products. The *combined* analytical LOD and LOQ for aldicarb (and products) was 0.050 ug/sample and 0.17 ug/sample respectively. The air concentration, expressed in units of ug/m^3 (or pptv), associated with the LOD is dependent on the volume of air sampled which varies from sample to sample. For a 24-hour sampling period at 4 Lpm the air concentration would be 0.0087 ug/m^3 (1.1 pptv) as associated with the LOD.

Of the twenty application samples collected during the first study (spikes, blanks, collocated and *background* samples excluded) two were found to be detected and the remaining 18 were less than the LOD of 0.050 ug/sample.

For the second application study, all four background samples had results less than the LOD. Of the twenty-four application samples collected (spikes, blanks, collocated and background samples excluded) all were found to be less than the LOD of 0.050 ug/sample.

Of the 60 ambient samples collected in Fresno County and the 55 collected in Kern County (spikes, blanks and collocated samples excluded), all were found to be less than the LOD of 0.050 ug/sample.

Acknowledgments

Staff of the ARB Testing Section collected the application and ambient samples. Assistance was provided by the Fresno County Agricultural Commissioner's Office and the Kern County Agricultural Commissioner's Office. Chemical analyses were performed by the Department of Food and Agriculture's Worker Health and Safety Laboratory.

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(contained in a separate volume)

DRAFT

Report for the Application and Ambient Air Monitoring of Aldicarb

I. Introduction

At the request of the California Department of Pesticide Regulation (DPR) (April 3, 1996 Memorandum, Sanders to Lew), the Air Resources Board (ARB) staff determined airborne concentrations of the pesticide aldicarb over a three week ambient monitoring program in Fresno County during the planting of cotton and over a three week ambient monitoring program in Kern County during *1st squaring* (tilling). Application monitoring was conducted twice in Fresno County around the use of aldicarb on cotton (during planting and 1st squaring). This monitoring was done to fulfill the requirements of AB 1807/3219 (Food and Agricultural Code, Division 7, Chapter 3, Article 1.5) which requires the ARB "to document the level of airborne emissions .... of pesticides which may be determined to pose a present of potential hazard..." when requested by the DPR. Method development and sample analyses were conducted by the Department of Food and Agriculture's Worker Health and Safety Laboratory (WHSL). Field monitoring was conducted by staff of the ARB Testing Section.

The "Protocol for the Application Air Monitoring of Aldicarb in Fresno County During March, 1997" and the "Protocol for the Ambient Air Monitoring of Aldicarb in Fresno County During April, 1997" are enclosed separately as Appendix I (page 1 of a separate volume of appendices to this report).

The WHSL report, "Air Sample Analysis Report for Aldicarb Application and Aldicarb Ambient", is enclosed separately as Appendix II (page 15 and 88 of the separate volume of appendices to this report). The sampling/analysis Standard Operating Procedures (SOP) are also enclosed in Appendix II (page 54 of the separate volume of appendices to this report).

The pesticide use report for the application study is enclosed separately as Appendix III (page 150 of the separate volume of appendices to this report).

The DPR's April 3, 1996 memorandum, "Monitoring Recommendation for Aldicarb" is enclosed separately as Appendix IV (page 152 of the separate volume of appendices to this report).

The application and ambient field log sheets are enclosed separately as Appendix V (page 159 of the separate volume of appendices to this report).

The application meteorological monitoring results for application #1 and #2 are enclosed separately as Appendix VI and VII respectively (page 171 and 177 of the separate volume of appendices to this report).

II. Chemical Properties of Aldicarb

The following information regarding the chemical properties of aldicarb was obtained from the DPR's April 3, 1996 "Monitoring Recommendation for Aldicarb" (page 156 of appendices).

Aldicarb (CAS:116-06-3) is a colorless crystalline solid with a faint sulfurous odor. Aldicarb has a molecular formula of $C_7H_{14}O_2N_2S$, a molecular weight of 190.27 g/mole, and a specific density of 1.195 at 25°C. It has a water solubility of 6.0 g/L at 25°C, a Henry's Constant of 1.45 x 10^{-9} atm·m^3/mol at 20-25 °C, and a vapor pressure of 3.47 x 10^{-5} mmHg at 25 °C. Aldicarb is miscible with most organic solvents.

In soil, aldicarb is rapidly converted to aldicarb sulfoxide in the presence of oxidizing agents and microorganisms. Further oxidation to the sulfone by microorganisms occurs at a slower rate. Mineralization was more rapid in aerobic surface soils than either aerobic or anaerobic subsurface soils; aldicarb degrades rapidly in aerobic silty clay loam soils releasing carbon dioxide. Reported soil half-life ($t_{1/2}$) ranges from 7 to 70 days. In water, the reported hydrolysis half-lives range from 175 to 245 days. In plants, with the exception of cotton, aldicarb is rapidly metabolized to aldicarb sulfoxide, sulfone and water soluble noncarbamate compounds. Aldicarb sulfoxide is highly soluble, acts systemically on the plant, and is 10-20 times more active as a cholinesterase inhibitor than the parent compound.

The acute oral LD_{50} of aldicarb for rats ranges from 650 to 930 ug/kg. The LC_{50} (96 hour) of aldicarb for rainbow trout is 0.88 mg/L, and for bluegill sunfish is 1.5 mg/L. The LC_{50} (72 hour) for bluegill sunfish is 100 ug/L. Aldicarb has entered the risk assessment process at DPR under the Birth Defect Prevention Act of 1984 (SB950) primarily because of its cholinesterase inhibition.

III. Sampling

A sketch of the sampling apparatus is shown in Attachment A of Appendix I (appendices pg. 7). Samples were collected by passing a measured volume of ambient air through XAD-2 resin. The XAD-2 resin tubes were obtained from SKC (#226-30-06). Calibrated rotameters were used to set and measure sample flow rates. The rotameters were calibrated using a certified digital bubble flowmeter. The flow rate, 4 Lpm, was accurately measured and the sampling system operated continuously with the exact operating interval noted. Samplers were leak checked prior to and after each sampling period with the sampling cartridges installed. Any change in the flow rates was recorded in the field log book (see appendices pg. 159). The resin tubes were protected from direct sunlight and supported about 1.5 meters above the ground (or roof) during the sampling period. At the end of each sampling period the tubes were capped and placed in culture tubes with an identification label affixed. The field log book was used to record start and stop times, sample identifications and any other significant comments. Subsequent to sampling, the samples were transported on dry ice, as soon as reasonably possible, to the WHSL. The samples were stored in the freezer or extracted/analyzed immediately.

A. Application Monitoring

The use pattern for aldicarb suggested that application-site monitoring should be associated with cotton and at an application rate between 0.5 and 2.0 pounds of active ingredient per acre. Application monitoring was conducted at two sites in Fresno County at application rates of 0.9 (planting) and 2.1 (1st squaring) pounds of active ingredient per acre. First squaring refers to a process of manual weed control (tilling) during which the insecticide is applied to the cotton row berms. Refer to Figures 2 and 3 for diagrams of the application sites. Refer to Appendix III (page 150 of appendices) for a copy of the pesticide use reports.

Information collected regarding each application included: 1) the elevation of each sampling station with respect to the field, 2) the orientation of the field with respect to North (identified as either true or magnetic), 3) an accurate record of the positions of the monitoring equipment with respect to the field, including the distance each monitor is positioned away from the edge of the field and an accurate drawing of the monitoring site showing the precise location of the monitoring equipment and any wind obstacles with respect to the field, 4) the field size, 5) the application rate, 6) formulation and 7) method and length of application. Details regarding site and application #1 are summarized below in Table 1. Note that the pesticide use report (appendices page 150) shows that 136.5 acres were treated whereas the field dimensions (908 yards by 898 yards) indicate an area of approximately 160 acres. Details regarding site and application #2 are summarized below in Table 2.

Table 1.
Application #1 Information

Range/Township/Section:	R18E/T16S/S3-SW1/4
Product Applied:	Temik 15G
Type of Application:	Ground, soil incorporated granular
Application Rate:	819 lbs.Temik 15G per 136.5 acres (0.9 lbs. aldicarb A.I. per acre)
Applicator/Grower:	Terranova Ranch Inc.

Table 2.
Application #2 Information

Range/Township/Section:	R18E/T16S/S9-NW1/4
Product Applied:	Temik 15G
Type of Application:	Ground, soil incorporated granular
Application Rate:	14 lbs.Temik 15G per acre (approx. 34-35 acres) (2.1 lbs. aldicarb A.I. per acre)
Applicator/Grower:	Helm Fertilizer/Terranova Ranch Inc.

A three day monitoring period was recommended in the DPR's April 3, 1996 "Air Monitoring Recommendation for Aldicarb" with intended sampling times as follows: (where the first sample

is started at the start of application) application + 1 hour, followed by one 2-hour sample, one 4-hour sample, two 8-hour samples and two 24-hour samples.

There were a number of problems associated with the first application study, conducted from March 24 to March 28, 1998. Background samples (before application) were not obtained and the first sample set was started 4 hours after the start of the application. The application was conducted over two days; from 0800 to 1830 on 3/24/97 and from 0800 to 1800 on 3/25/97 and was at an application rate less than desired for the study. Also, the meteorological station stopped collecting data (equipment malfunction) approximately a day before the end of the study. Thus, this first application study may not provide useful data for modeling or risk assessment purposes but the monitoring results are included in this report. Samples were collected as outlined in Table 3. Referring to Figure 3, the application started at the northwest corners of the two shaded areas (2 application rigs) with the rows oriented east/west. Four samplers were positioned, one on each side of the field. A fifth sampler was collocated at the east position. The west, north, east and south samplers were positioned approximately 10 yards, 10 yards, 10 yards and 15 yards from the field respectively. All of the samplers were at the same elevation as the field. The meteorological station was positioned approximately ½ mile west of the southwest corner of the field (oriented toward geographic north).

Table 3.
Application #1 Sampling Periods

Period		Date	Time
1	Application plus 2 hours	3/24/97	1230 to 2030
2	11.75 hour	3/24-25/97	2030 to 0815
3	Application plus 17 hours	3/25-26/97	0815 to 0915
4	23.25 hours	3/26-27/97	1915 to 0830
5	25.5 hour	3/27-28/97	0830 to 1000

Because of the problems associated with the first aldicarb application study, as mentioned above, the study was re-done. Prior to the 2nd application study, background samples were taken at each position to establish if any aldicarb was detectable in the air before the application (i.e., from nearby applications). An application had been conducted on the south ½ of the plot (see the shaded area of Figure 4) 2 days prior, at the same application rate. The background samples were collected from 0830 on June 23 to 0730 on June 24, 1997 (23 hours). The June 25, 1997 application started at 1100 and ended at 1745 (samplers were started at 0730). Referring to Figure 4, with the rows oriented east/west, the application started at the northwest side. Samples were collected as outlined in Table 4.

Table 4.
Application #2 Sampling Periods

Period		Date	Time
1	Application plus 0.25 hours	6/25/97	0730 to 1800
2	2 hours	6/25/97	1800 to 2000
3	4 hours	6/25/97	2000 to 2400
4	8.25 hours	6/26/97	0000 to 0815
5	24.5 hours	6/26-27/97	0815 to 0845
6	24.75 hours	6/27-28/97	0845 to 0930

Four samplers were positioned, one on each side of the field. A fifth sampler was collocated at the south position. The west, north and east samplers were positioned approximately 10 yards, 15 yards and 14 yards from the field respectively. The south sampler was positioned 13 yards from the south edge of the prior application area (shaded area on Figure 4), which put it 534 yards south of the application study area. All of the samplers were at the same elevation as the field. The meteorological station was positioned at the northwest corner of the field (oriented toward geographic north).

The meteorological station was set up to determine wind speed and direction, barometric pressure, relative humidity and air temperature. This station continued to operate continuously throughout the sampling period collecting data at 1 minute intervals using a data logger. The raw meteorological station data will be forwarded along with this report on a 1.44 MB diskette (comma delimited format). Appendices VI and VII (pages 171 and 177 of the appendices) list the meteorological station data for wind direction and speed, barometric pressure, relative humidity and air temperature in 15 minute averages for the test periods. The data listed for the wind direction is the arithmetic average for each 15 minute interval and is not valid when the direction varies around 0 degrees. The DPR will need to use an appropriate direction averaging program if 15 minute averages are required for wind direction. ARB staff noted the degree of cloud cover, on the sample log sheets, whenever sample cartridges were changed. The skies were clear during both application studies.

B. Ambient Monitoring

The use patterns for aldicarb suggested that ambient monitoring should be conducted in June in Kern County or in April in Fresno County and should be associated with cotton. Ambient monitoring was initially conducted during a three week period from March 24 to April 11, 1997 in Fresno County. The monitoring was scheduled to coincide with cotton planting and the aldicarb samplers were collocated with samplers being used for an ambient phorate air monitoring study (see the November 13, 1998 "Report for the 1997 Phorate Air Monitoring", Lew to Okumura). Four sampling sites were selected by ARB personnel from the areas of Fresno County where cotton farming is predominant and in relatively high population areas or in areas frequented by people. Sites were selected with considerations for both accessibility and security of the sampling equipment. The five sites are listed in Table 5. Twenty-four hour

(approximately) samples were taken Monday through Friday (4 samples/week) at a flow rate of 4 liters per minute. Twelve discreet sampling-days were monitored at each site for a total of 60 samples (plus 15 collocated samples and 3 trip blanks).

Table 5.
Ambient Sampling Sites, Fresno County

BOR	Burrel Elementary School 16704 South Jameson Burrel, CA 93607 Range/Township/Section: R18E/T16S/S35-NW1/4 of SW1/4	(209) 866-5634 Mildred Wylie, Principal
ARB	Air Resources Board, Ambient Air Monitoring Station 3425 N First, Suite 205B Fresno, CA 228-1825 Range/Township/Section: R20E/T13S/S22-SE1/4 of SE1/4	(209) 228-1825 Dave Wilkerson
FP	Westside Elementary School 19191 Excelsior Ave. Five Points, CA 93624 Range/Township/Section: R17E/T17S/S22-SE1/4 of SE1/4	(209) 884-2492 Rosemary Debillar, Principal
SJ	San Joaquin Elementary School 8535 South 9th San Joaquin, CA 93660 Range/Township/Section: R16E/T15S/S23-SE1/4 of SE1/4	(209) 875-6521 Jackie Newman, Principal
HEL	Helm Elementary School 13883 S. Lassen Avenue Helm, CA 93627 Range/Township/Section: R17E/T16S/S15-SE1/4 of SE1/4	(209) 866-5683 Sylvia Grider, Principal

The Burrel Elementary School is in the small town of Burrel. There are cotton fields directly to the north and east at a distance of approximately 100 yards and there was alfalfa growing to the west of the school. The sampling unit was placed on the roof of a single story building at a height of approximately 12 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 16 feet.

The background monitoring was conducted at the ARB's ambient air monitoring station in downtown Fresno. The nearest cotton fields were at a distance of 20 to 30 miles to the west and southwest. The sampler was placed on a second story roof near other ARB monitoring equipment and the sample height was approximately 4 feet above the roof (approximately 35 feet above the ground).

The Westside Elementary School is situated in the sparsely populated area of Five Points. The school is surrounded on all sides (approximately 50 to 100 yards) by farmland (bare ground at the time). The sampling unit was placed on the roof of a single story building at a height of approximately 20 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 24 feet.

The San Joaquin High and Elementary Schools are located in a residential area of San Joaquin. There are no crops grown in the immediate area surrounding the schools but cotton is grown in all directions at a distance of approximately 3/4 to 1 mile. The sampling unit was placed on the top of a railroad car/storage shed (behind the bus barn) at a height of approximately 8 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 12 feet.

The Helm Elementary School is in the small town of Helm. There are cotton fields approximately 300 yards to the north, 100 yards to the west and 200 yards to the south of the school. The sampling unit was placed on the roof of a single story building at a height of approximately 11 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 15 feet.

A second period of ambient monitoring was also conducted during a three week period from June 10 to June 27, 1997 in Kern County. The monitoring was scheduled to coincide with cotton and the use of aldicarb "at first squaring." Four sampling sites were selected by ARB personnel from the areas of Kern County where cotton farming is predominant and in relatively high population areas or in areas frequented by people. Sites were selected with considerations for both accessibility and security of the sampling equipment. The five sites are listed in Table 6. Twenty-four hour (approximately) samples were taken Monday through Friday (4 samples/week) at a flow rate of 4 liters per minute. Eleven discreet sampling-days were monitored at each site for a total of 55 samples (plus 15 collocated samples, 3 trip blanks and 15 QA spikes).

Table 6.
Ambient Sampling Sites, Kern County

WAS	Wasco High School 1900 7th St. Wasco, CA 93280 Range/Township/Section: R24E/T27S/S12-NW1/4	(805) 758-7100 Tom Ware, Vice Principal
ARB	Air Resources Board, Ambient Air Monitoring Station 5558 California Avenue, Suite 460 Bakersfield, CA 93309 Range/Township/Section: R27E/T29S/S34-SW1/4	(805) 334-3991 Phil Powers
MCF	McFarland Learning Center 599 5th St.. McFarland, CA 93250 Range/Township/Section: R25E/T26S/S12-S1/2	(805) 792-3081 Dr. Perry, Assist. Sup.
MAP	Maple School 29161 Fresno Ave. Shafter, CA 93263 Range/Township/Section: R24E/T28S/S12-NW1/4	(805) 746-4439 Ann C. Paslay, Superintendent
SEV	Kern Seventh Day Adventist Elementary School 30105 Riverside Shafter, CA 93263 Range/Township/Section: R25E/T28S/S21-NW1/4	(805) 746-4467 Sharon Messer, Principal

The Wasco High School is in a residential area in the small town of Wasco. There were cotton fields approximately 1 mile to the east and several miles to the west. The sampling unit was placed on the roof of an announcer's booth (at the football field) at a height of approximately 46 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 50 feet.

The background monitoring was conducted at the ARB's ambient air monitoring station in downtown Bakersfield. The nearest cotton fields were at a distance of approximately 10 miles to the northeast. The sampler was placed on a one story roof near other ARB monitoring equipment and the sample height was approximately 4 feet above the roof (approximately 25 feet above the ground).

The McFarland Learning Center is situated in a residential area in the town of McFarland. The nearest cotton fields were at least 2 miles away. The sampling unit was placed on the roof of a single story building at a height of approximately 16 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of

approximately 20 feet.

The Maple School is located in a rural area outside of the small town of Shafter. The nearest cotton fields were approximately ½ mile to the east. The sampling unit was placed on the top of a one story building at a height of approximately 12 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 16 feet.

The Kern Seventh Day Adventist Elementary School is in a rural area just outside of the small town of Shafter. There are cotton fields approximately 50 yards to the north and 100 yards to the east and west. The sampling unit was placed on the roof of a single story building at a height of approximately 9 feet. The sampling cartridges were positioned approximately 4 feet above the roof. Thus, air was sampled through the cartridges at a height of approximately 13 feet.

IV. Analytical Methodology

"The Standard Operating Procedures for the Analysis of Aldicarb and Metabolites on XAD-2 Resin Air Sampling Cartridges" are enclosed as Appendix II (page 54 of appendices). The procedures specify that the exposed XAD-2 resin tubes are stored in an ice chest on dry ice or in a freezer until extraction. Samples are equilibrated to room temperature, desorbed with 4 mLs of methanol, and reduced in volume to 0.667 mLs prior to injection. The validated injection volume is 100 uL, comprised of 30 uL of sample and 70 uL of water. The samples are analyzed by HPLC with autosampler, a C18 column, post column system, OPA derivitization and fluorescence detection. This method determines aldicarb, aldicarb sulfoxide and aldicarb sulfone. Results of the three compounds are mathematically converted back to parent compound and reported as total aldicarb.

V. Application and Ambient Results

Tables 7 and 8 present the results of application studies #1 and #2 respectively. Tables 9 and 10 present the results of the ambient monitoring studies conducted in Fresno and Kern Counties respectively. Laboratory results, in units of ug/sample, equal to or above the limit of quantitation (LOQ) are reported to 2 significant figures. Air concentration results (in units of ug/m^3 and pptv) are also reported to 2 significant figures. Results below the limit of quantitation but equal to or above the limit of detection (LOD) are reported as detected (Det.). Results below the LOD are reported as <LOD. The equation used to convert aldicarb air concentration from units of ug/m^3 to volume/volume units (pptv) at 1 atmosphere and 25 °C is:

$$\text{pptv} = (ug/m^3) \times \frac{(0.0820575 \text{ liter-atm/mole-°K})(298 \text{°K})}{(1 \text{ atm})(190.27 \text{ gram/mole})} = (128.5) \times (ug/m^3)$$

The method development results showed that the parent compound, aldicarb, was partially oxidized to aldicarb sulfoxide and aldicarb sulfone on the resin during the 24 hour sampling at 4 Lpm. Consequently, the LOD and LOQ for the sample results were reported as the combined values for aldicarb and the degradation products. The WHSL determined the LOD as 3 times the baseline noise and the LOQ as 10 times the baseline noise. The *combined* analytical LOD and LOQ for

aldicarb (and products) was 0.050 ug/sample and 0.17 ug/sample respectively. The air concentration, expressed in units of ug/m^3 (or pptv), associated with the LOD is dependent on the volume of air sampled which varies from sample to sample. For a 24-hour sampling period at 4 Lpm the air concentration would be 0.0087 ug/m^3 (1.1 pptv) as associated with the LOD.

A. Application Monitoring Results

The application sample results are also summarized as associated with sampling period wind roses in Figures 5 and 6.

For application #1, no background samples were collected before the start of the application. However, *background* samples were collected *during* each sampling period at the location of the meteorological station (½ mile west of the study site). All of these *background* samples had results less than the LOD. Of the twenty application samples collected (spikes, blanks, collocated and *background* samples excluded) two were found to be detected (south site during periods 1 and 4) and the remaining 18 were less than the LOD of 0.050 ug/sample.

For application #2, all four background samples had results less than the LOD. Of the twenty-four application samples collected (spikes, blanks, collocated and background samples excluded) none were found to be above the LOD of 0.050 ug/sample.

Referring to the field log sheets (page 159 of the appendices), all application samples were collected under clear sky conditions.

B. Ambient Monitoring Results

Of the 60 ambient samples collected in Fresno County and the 55 collected in Kern County (spikes, blanks and collocated samples excluded), none were found to be above the LOD of 0.050 ug/sample.

Refer to the field log sheets (page 159 of the appendices) for sky conditions during the studies.

VI. Quality Assurance

Field quality control (QC) for the application monitoring included the following:

1) Four field spikes (same environmental and experimental conditions as those occurring at the time of ambient sampling) prepared by the WHSL staff. The field spikes were obtained by sampling ambient air at 4 L/minute (collocated with a sample);
2) four trip spikes;
3) replicate samples (collocated) collected at one of the four sampling sites;
4) a trip blank; and
5) background samples.

The DPR's April 3, 1996 memo, "Monitoring Recommendation for Aldicarb", stated that "Field blank and field spike samples should be collected at the same environmental (temperature,

humidity, exposure to sunlight) and experimental (similar air flow rates) conditions as those occurring at the time of sampling." The background samples were collected at the same environmental and experimental conditions as those occurring at the time of sampling (except for total sample volume). However, no "field blanks" were collected. Collection of true field blanks would involve rather complicated procedures and is not practical under field conditions. The trip blank was collected at the time of the sampling but did not experience the same environmental and experimental conditions except for transport and storage.

Field QC for the ambient monitoring included the following:

1) Five field spikes (same environmental and experimental conditions as those occurring at the time of ambient sampling) prepared by the Testing Section staff; the field spikes were obtained by sampling ambient air at the background monitoring site for 24 hour periods at 4L/minute (collocated with an ambient sample);
2) five trip spikes;
3) replicate (collocated) samples taken for three dates at each sampling location; and
4) trip blanks collected once per week (see comment above regarding field blanks).

The instrument dependent parameters (reproducibility, linearity and LOD) are discussed in the SOP (page 54 of the appendices) and in the analytical report (page 15 of the appendices). A chain of custody sheet accompanied all samples. Rotameters were calibrated before the monitoring using a certified digital bubble-flowmeter. The rotameter calibrations were also checked at the end of the study and found to be unchanged.

VII. Quality Assurance Results

A. Method Development

Refer to Appendix II (page 54 of the appendices), "Standard Operating Procedure for the Sampling and Analysis of Aldicarb", for discussion and results of method development studies. The freezer stability studies showed acceptable recoveries of aldicarb (96%) after 56 days of storage. The longest ambient sample storage period as indicated by the lab report was 36 days.

B. Trip Blanks

The application and ambient trip blank results were all less than the LOD of 0.050 ug/sample for aldicarb.

C. Application Background Sample Results

All of the application background samples had results less than the LOD for aldicarb.

D. Collocated Sample Results

All application and ambient collocated sample results were less than the LOD for aldicarb.

E. Laboratory Spikes

Laboratory spikes are prepared at the same time and at the same level as the trip spike and field

spike sets. The laboratory spikes are kept in a freezer until extraction and analysis. The extraction and analysis of laboratory, trip and field spikes normally occurs at the same time. Laboratory spikes were prepared by WHSL staff.

The laboratory spike results for the application #1, #2 and the ambient studies are listed in Tables 11, 14 and 17 respectively. Each of the spike cartridges was spiked with 0.70 ug of aldicarb. The average recoveries for the application #1, #2 and ambient lab spikes were 85.5%, 90.7% and 97.2% respectively.

F. Trip Spikes

Trip spikes are prepared at the same time and at the same level as the laboratory spike and field spike sets. The trip spikes are kept in a freezer until transported to the field. The trip spike samples are kept on dry ice in an ice chest (the same one used for samples) during transport to and from the field and at all times while in the field except for trip spike sample log-in and labeling. Trip spikes for the application and ambient studies were prepared by WHSL staff.

The trip spike results for the application #1, #2 and ambient studies are listed in Tables 12, 15 and 18 respectively. Each of the spike cartridges was spiked with 0.70 ug of aldicarb. The average recovery for the application #1, #2 and ambient trip spikes was 80%, 99% and 91% respectively. These results are consistent with the lab spike results and indicate that the sample transport, storage and analytical procedures used in this study produce acceptable results for aldicarb.

G. Field Spikes

Field spikes are prepared at the same time and at the same level as the laboratory spike and trip spike sets. The field spikes are kept in a freezer until transported to the field. The field spike samples are kept on dry ice in an ice chest (the same one used for samples) during transport to and from the field and at all times while in the field except for the sampling period. Field spikes were collected at the same environmental and experimental conditions as those occurring at the time of ambient sampling. The field spikes were obtained by sampling ambient air through a previously spiked cartridge. (i.e., collocated with an ambient or background sample). Field spike sets for the application and ambient studies were prepared by WHSL staff.

The field spike results for the application #1, #2 and ambient studies are listed in Tables 13, 16 and 19 respectively. Each of the spike sampling cartridges was spiked with 0.70 ug of aldicarb. The average recovery for the application #1, #2 and ambient field spikes was 90%, 105% and 83% respectively. The recovery for field spike BAK-9S4 was 17%. This low recovery cannot be readily explained but is the only significant outlier in the spike results. These results (with the exception of BAK-9S4) are consistent with the lab and trip spike results and indicate that the sampling, sample transport, storage and analytical procedures used in this study produce acceptable results for aldicarb.

FIGURE 1. ALDICARB MONITORING AREA, FRESNO COUNTY

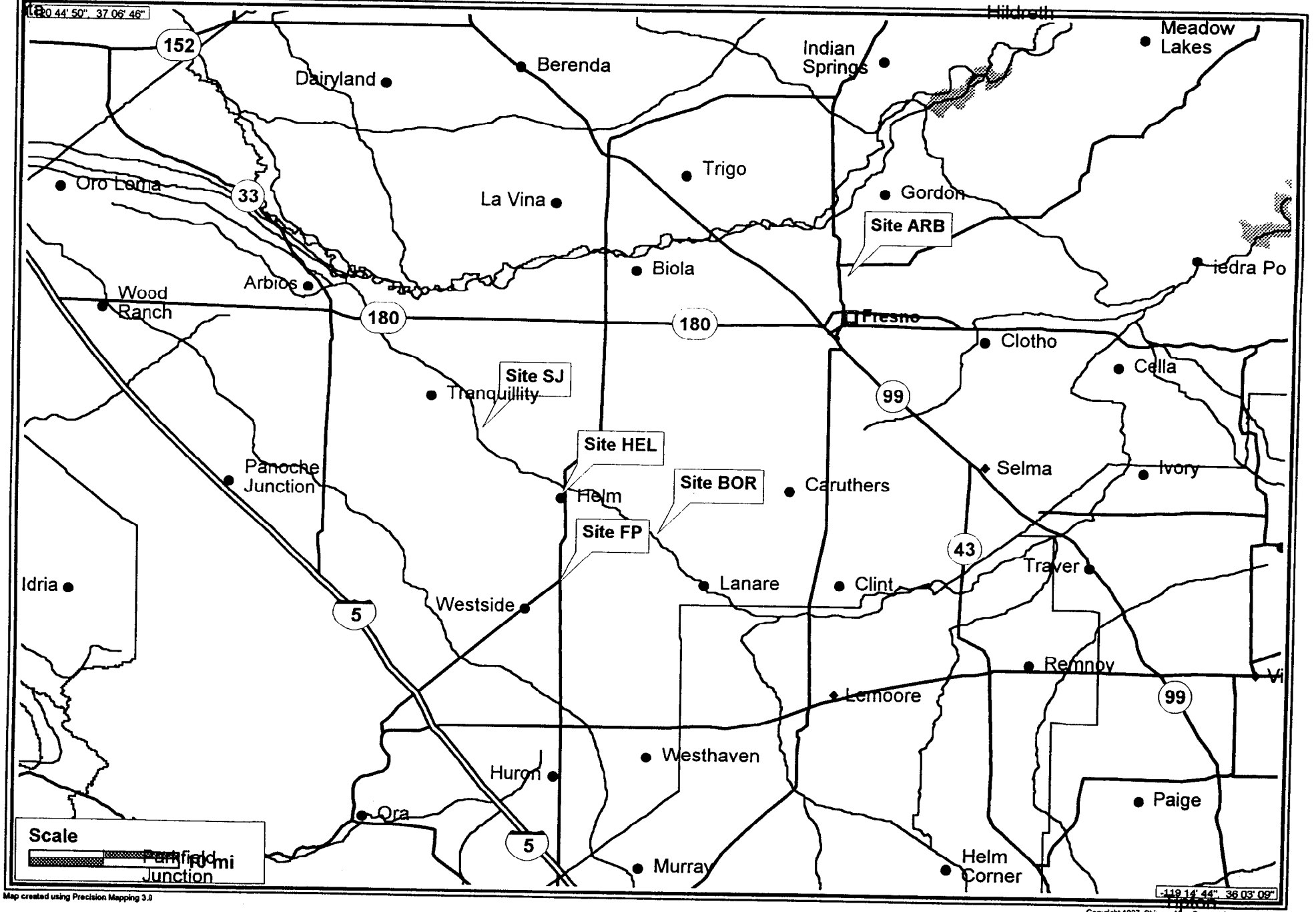


Figure 2. Aldicarb Monitoring Area, Kern County

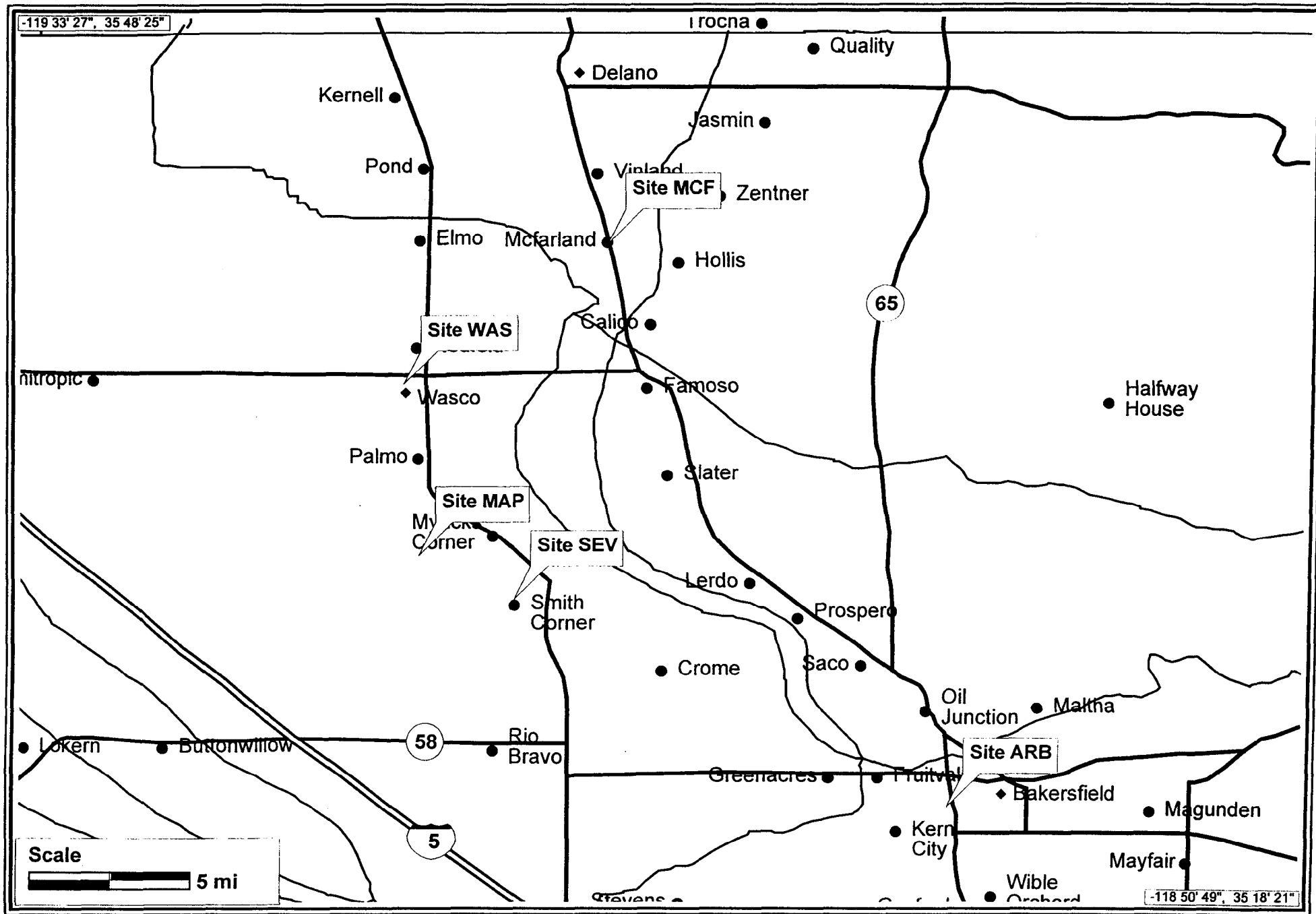
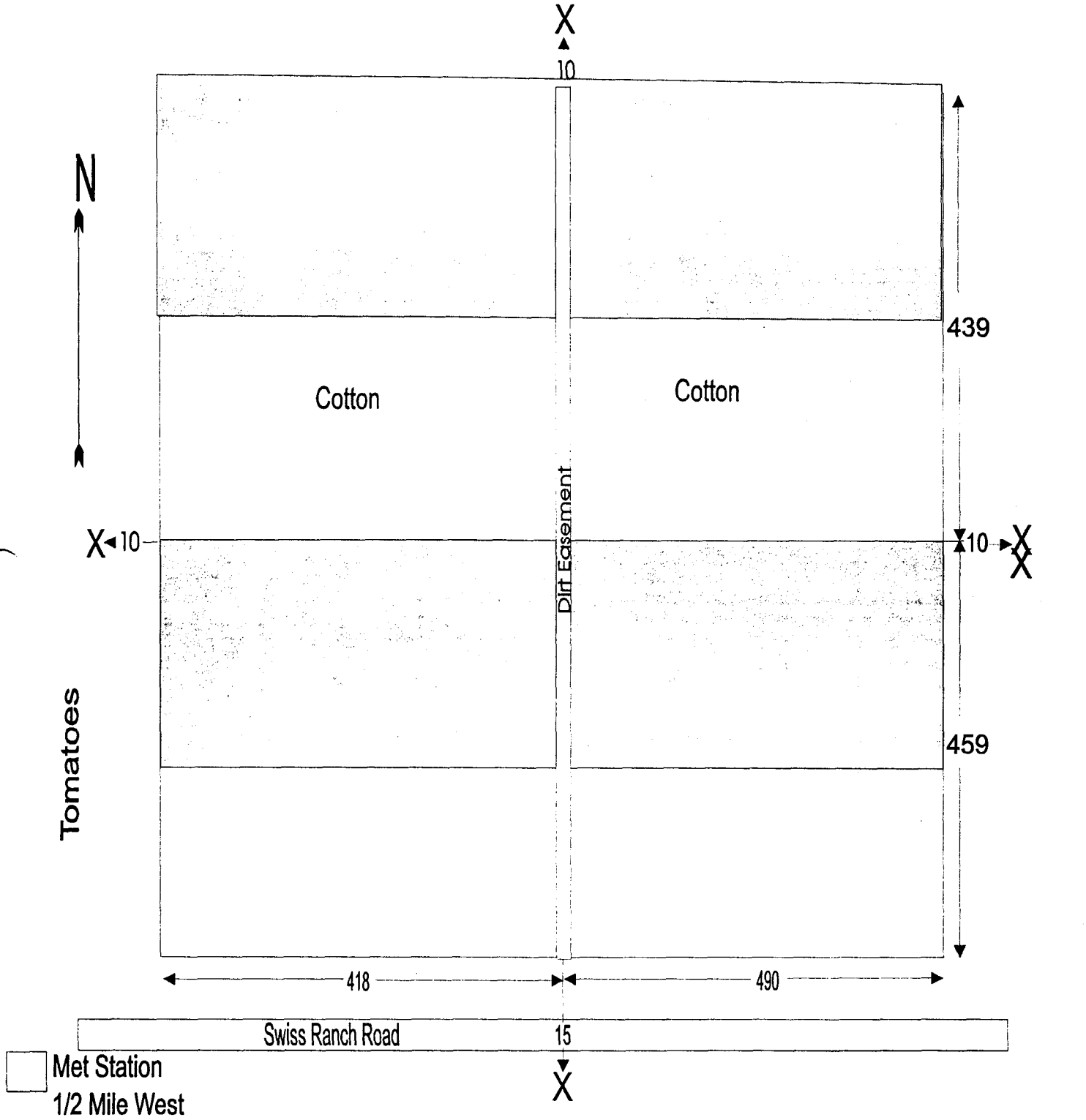


Figure 3

Aldicarb Application Site #1



* Distance in yards

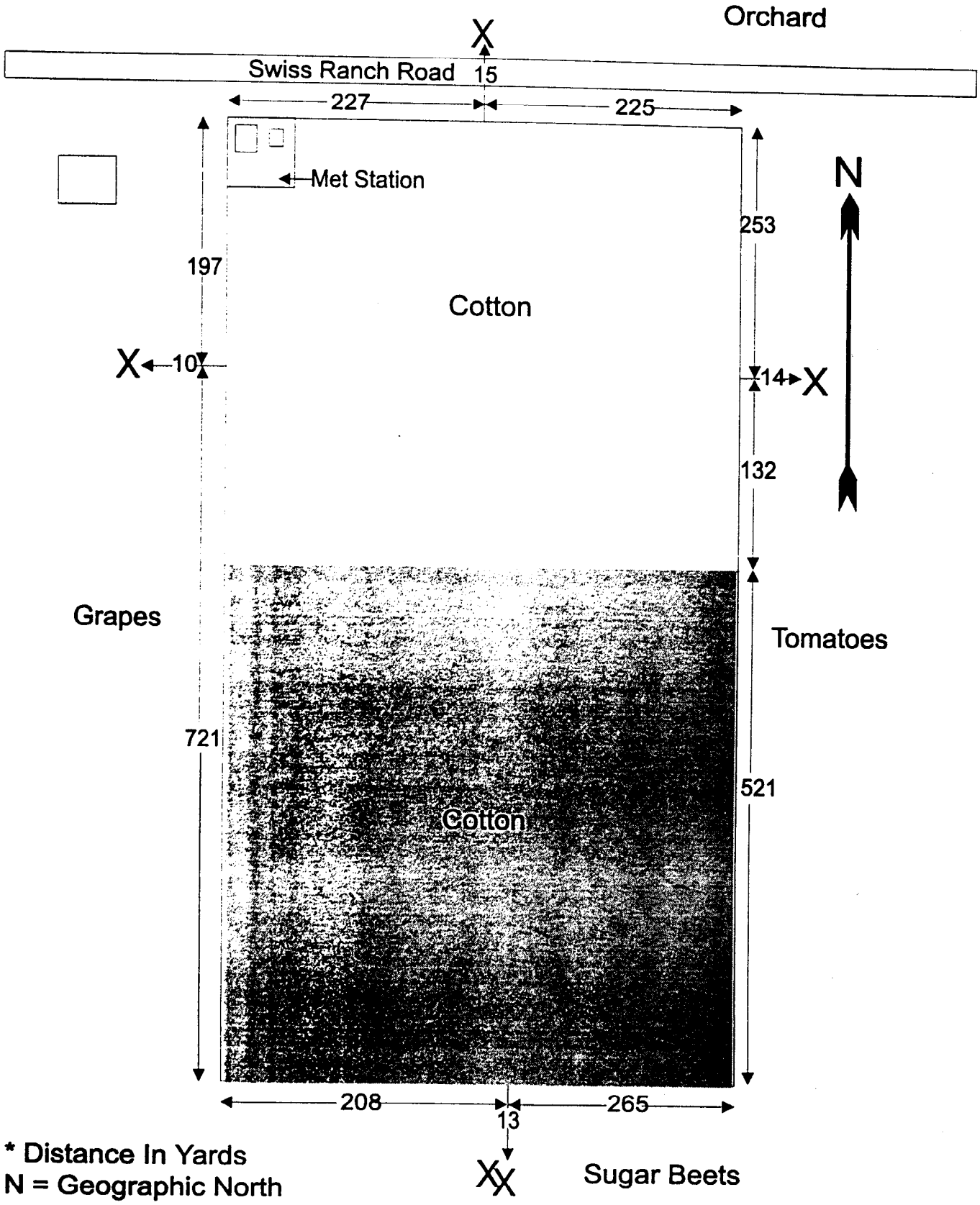
N = Geographic North

First Application Day

Second Application Day

Figure 4

Aldicarb Application Site #2



* Distance In Yards

N = Geographic North

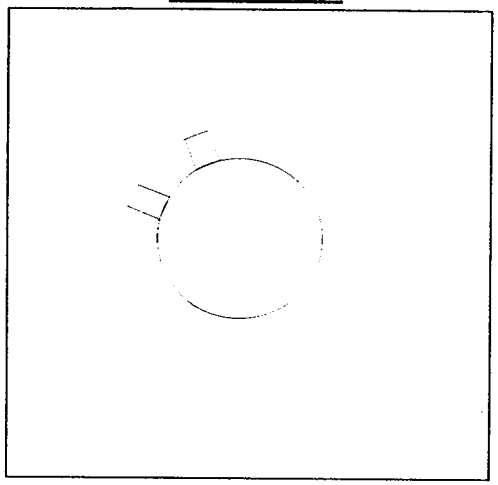
Previous Application Area (2 days prior)

FIGURE 5. ALDICARB #1 APPLICATION DATA (ug/m3)

PERIOD 1
8.0Hours

[N] <LOD

[W] <LOD



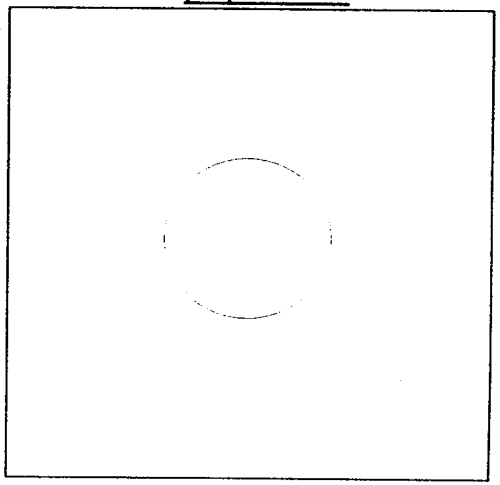
[E] <LOD
[ED] <LOD

[S] DET

PERIOD 2
11.75 Hours

[N] <LOD

[W] <LOD



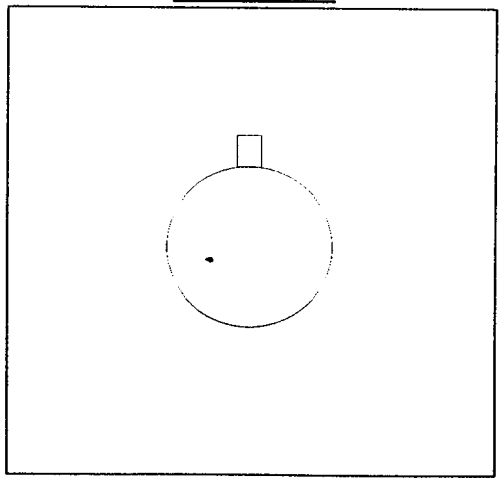
[E] <LOD
[ED] <LOD

[S] <LOD

PERIOD 3
25 Hours

[N] <LOD

[W] <LOD



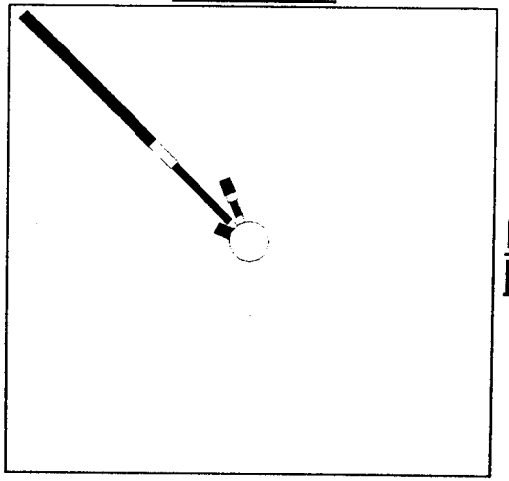
[E] <LOD
[ED] <LOD

[S] <LOD

PERIOD 4
11 Hours of
23.25 Hours

[N] <LOD

[W] <LOD



E < LOD
[ED] <LOD

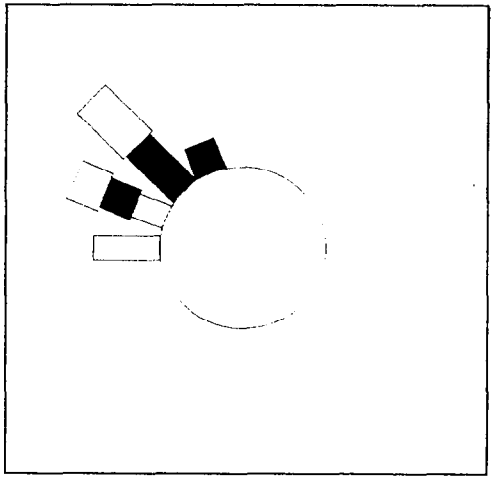
[S] Det

FIGURE 6. ALDICARB #2 APPLICATION DATA (ug/m3)

BACKGROUND
23.0Hours

[N] <LOD

[W] <LOD



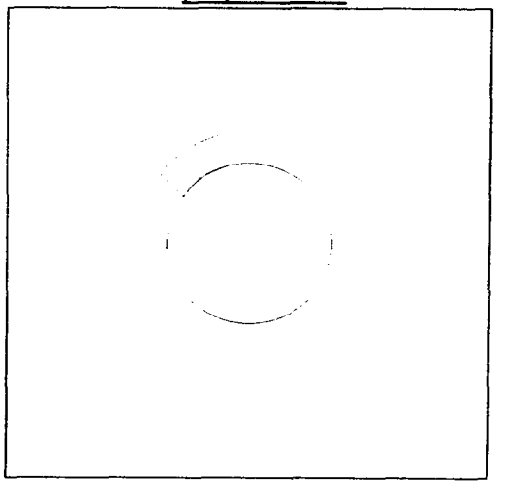
[E] <LOD

[S] < LOD
[SD] <LOD

PERIOD 1
10.75 Hours

[N] <LOD

[W] <LOD



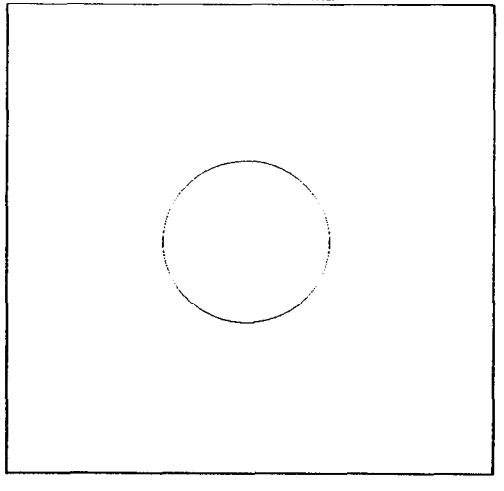
[E] <LOD

[S] <LOD
[SD] <LOD

PERIOD 2
2 Hours

[N] <LOD

[W] <LOD



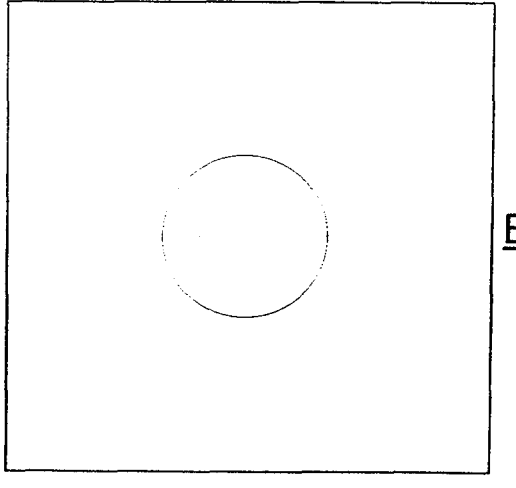
[E] <LOD

[S] <LOD
[SD] <LOD

PERIOD 3
4 Hours

[N] <LOD

[W] <LOD



E < LOD

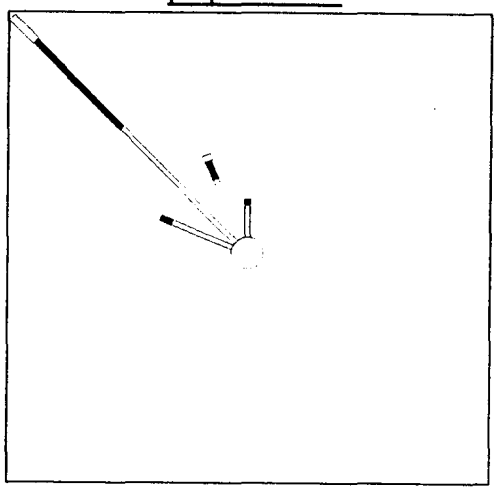
[S]< LOD
[SD] <LOD

FIGURE 6. ALDICARB #2 APPLICATION DATA (ug/m3)

PERIOD 4
8.25 Hours

[N] <LOD

[W] <LOD



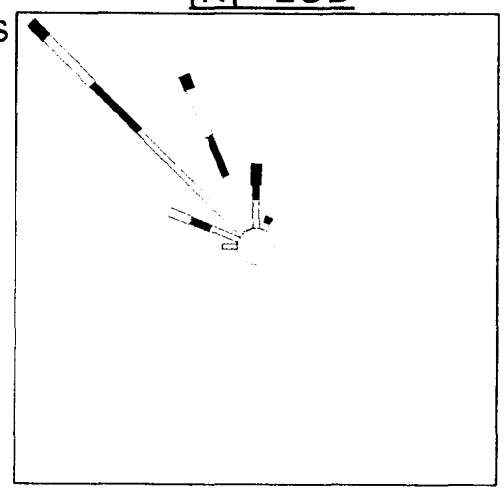
[E] <LOD

[S] < LOD
[SD] <LOD

PERIOD 5
24.25 Hours

[N] <LOD

[W] <LOD



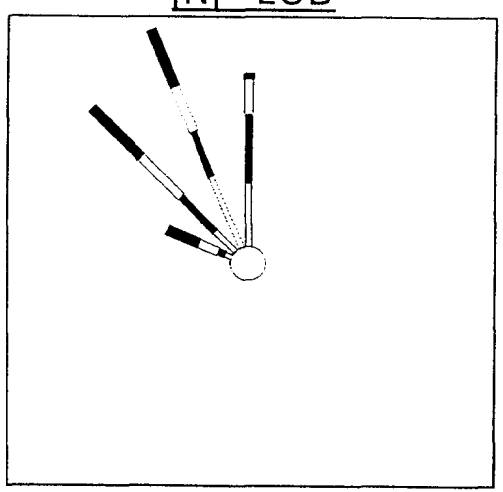
[E] <LOD

[S] <LOD
[SD] <LOD

PERIOD 6
24.75 Hours

[N] <LOD

[W] <LOD



[E] <LOD

[S] <LOD
[SD] <LOD

Table 7. Aldicarb Application #1 Monitoring Results

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	*Sample volume (m^3)	Aldicarb (ug/sample)	(ug/m3)	**(pptv)
1	ALDW1	3/24/97 12:25	3/24/97 20:45	500	1.9	<LOD	<LOD	<LOD
2	ALDN1	3/24/97 12:30	3/24/97 20:40	490	1.9	<LOD	<LOD	<LOD
3	ALDE1	3/24/97 13:25	3/24/97 20:30	425	1.6	<LOD	<LOD	<LOD
4	ALDE1D	3/24/97 13:25	3/24/97 20:30	425	1.6	<LOD	<LOD	<LOD
5	ALDS1	3/24/97 12:40	3/24/97 20:25	465	1.8	Det.	Det.	Det.
6	ALDB1	3/24/97 12:55	3/24/97 20:50	475	1.8	<LOD	<LOD	<LOD
7	ALDS2	3/24/97 20:25	3/25/97 08:00	695	2.6	<LOD	<LOD	<LOD
8	ALDE2	3/24/97 20:30	3/25/97 08:05	695	2.6	<LOD	<LOD	<LOD
9	ALDE2D	3/24/97 20:30	3/25/97 08:05	695	2.6	<LOD	<LOD	<LOD
10	ALDN2	3/24/97 20:40	3/25/97 08:15	695	2.6	<LOD	<LOD	<LOD
11	ALDW2	3/24/97 20:45	3/25/97 08:25	700	2.7	<LOD	<LOD	<LOD
12	ALDB2	3/24/97 20:50	3/25/97 08:35	705	2.7	<LOD	<LOD	<LOD
13	ALDS3	3/25/97 08:00	3/26/97 09:12	1512	5.7	<LOD	<LOD	<LOD
14	ALDE3	3/25/97 08:05	3/26/97 09:18	1513	5.7	<LOD	<LOD	<LOD
15	ALDE3D	3/25/97 08:05	3/26/97 09:18	1513	5.7	<LOD	<LOD	<LOD
16	ALDN3	3/25/97 08:15	3/26/97 09:25	1510	5.7	<LOD	<LOD	<LOD
17	ALDW3	3/25/97 08:25	3/26/97 09:32	1507	5.7	<LOD	<LOD	<LOD
18	ALDB3	3/25/97 08:35	3/26/97 09:50	1515	5.8	<LOD	<LOD	<LOD
20	ALDS4	3/26/97 09:12	3/27/97 08:20	1388	5.3	Det.	Det.	Det.
21	ALDE4	3/26/97 09:18	3/27/97 08:30	1392	5.3	<LOD	<LOD	<LOD
22	ALDE4D	3/26/97 09:18	3/27/97 08:30	1392	5.3	<LOD	<LOD	<LOD
24	ALDN4	3/26/97 09:25	3/27/97 08:25	1380	5.2	<LOD	<LOD	<LOD
26	ALDW4	3/26/97 09:32	3/27/97 08:40	1388	5.3	<LOD	<LOD	<LOD
28	ALDB4	3/26/97 09:50	3/27/97 08:50	1380	5.2	<LOD	<LOD	<LOD
33	ALDS5	3/27/97 08:20	3/28/97 10:00	1540	5.9	<LOD	<LOD	<LOD
34	ALDE5	3/27/97 08:30	3/28/97 10:03	1533	5.8	<LOD	<LOD	<LOD
35	ALDE5D	3/27/97 08:30	3/28/97 10:03	1533	5.8	<LOD	<LOD	<LOD
36	ALDN5	3/27/97 08:35	3/28/97 10:06	1531	5.8	<LOD	<LOD	<LOD
37	ALDW5	3/27/97 08:40	3/28/97 10:08	1528	5.8	<LOD	<LOD	<LOD
38	ALDB5	3/27/97 08:50	3/28/97 10:00	1510	5.7	<LOD	<LOD	<LOD

LOD = 0.050 ug/sample
Det. = <LOQ of 0.17 ug/sample but >LOD
*Sample flow rate of 3.8 Lpm
** pptv at 1 atm and 25 C
NA = Not Applicable

Table 8. Aldicarb Application #2 Monitoring Results

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample volume (m^3)	Aldicarb (ug/sample)	(ug/m3)	*(pptv)
1	WB	6/24/97 08:25	6/25/97 07:25	1380	5.5	<LOD	<LOD	<LOD
3	SB	6/24/97 08:35	6/25/97 07:28	1373	5.5	<LOD	<LOD	<LOD
5	EB	6/24/97 08:45	6/25/97 07:36	1371	5.5	<LOD	<LOD	<LOD
7	NB	6/24/97 08:55	6/24/97 19:25	630	2.5	<LOD	<LOD	<LOD
9	W1	6/25/97 07:25	6/25/97 18:00	635	2.5	<LOD	<LOD	<LOD
10	S1	6/25/97 07:25	6/25/97 18:05	640	2.6	<LOD	<LOD	<LOD
11	S1D	6/25/97 07:25	6/25/97 18:05	640	2.6	<LOD	<LOD	<LOD
12	E1	6/25/97 07:36	6/25/97 18:10	634	2.5	<LOD	<LOD	<LOD
13	N1	6/25/97 07:45	6/25/97 18:13	628	2.5	<LOD	<LOD	<LOD
14	W2	6/25/97 18:00	6/25/97 19:55	115	0.5	<LOD	<LOD	<LOD
15	S2	6/25/97 18:05	6/25/97 20:00	115	0.5	<LOD	<LOD	<LOD
16	S2D	6/25/97 18:05	6/25/97 20:00	115	0.5	<LOD	<LOD	<LOD
17	E2	6/25/97 18:10	6/25/97 20:05	115	0.5	<LOD	<LOD	<LOD
18	N2	6/25/97 18:13	6/25/97 20:10	117	0.5	<LOD	<LOD	<LOD
19	W3	6/25/97 19:55	6/26/97 00:01	246	1.0	<LOD	<LOD	<LOD
20	S3	6/25/97 20:00	6/26/97 00:03	243	1.0	<LOD	<LOD	<LOD
21	S3D	6/25/97 20:00	6/26/97 00:03	243	1.0	<LOD	<LOD	<LOD
22	E3	6/25/97 20:05	6/26/97 00:08	243	1.0	<LOD	<LOD	<LOD
23	N3	6/25/97 20:10	6/26/97 00:14	244	1.0	<LOD	<LOD	<LOD
24	W4	6/26/97 00:01	6/26/97 08:10	489	2.0	<LOD	<LOD	<LOD
25	S4	6/26/97 00:03	6/26/97 08:15	492	2.0	<LOD	<LOD	<LOD
26	S4D	6/26/97 00:03	6/26/97 08:15	492	2.0	<LOD	<LOD	<LOD
27	E4	6/26/97 00:08	6/26/97 08:20	492	2.0	<LOD	<LOD	<LOD
28	N4	6/26/97 00:14	6/26/97 08:25	491	2.0	<LOD	<LOD	<LOD
29	W5	6/26/97 08:10	6/27/97 08:40	1470	5.9	<LOD	<LOD	<LOD
30	S5	6/26/97 08:15	6/27/97 08:50	1475	5.9	<LOD	<LOD	<LOD
31	S5D	6/26/97 08:15	6/27/97 08:50	1475	5.9	<LOD	<LOD	<LOD
32	E5	6/26/97 08:20	6/27/97 08:55	1475	5.9	<LOD	<LOD	<LOD
33	N5	6/26/97 08:25	6/27/97 09:00	1475	5.9	<LOD	<LOD	<LOD
38	Blank	7/01/97 08:45	7/01/97 08:45	0	0.0	NA	NA	NA
39	W6	6/27/97 08:45	6/28/97 09:30	1485	5.9	<LOD	<LOD	<LOD
40	S6	6/27/97 08:50	6/28/97 09:30	1480	5.9	<LOD	<LOD	<LOD
41	S6D	6/27/97 08:50	6/28/97 09:30	1480	5.9	<LOD	<LOD	<LOD
42	E6	6/27/97 08:55	6/28/97 09:30	1475	5.9	<LOD	<LOD	<LOD
43	N6	6/27/97 09:00	6/28/97 09:35	1475	5.9	<LOD	<LOD	<LOD

LOD = 0.050 ug/sample
* pptv at 1 atm and 25 C
NA = Not Applicable

Table 9. Aldicarb Ambient Monitoring Results - Fresno County

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Volume (m3)	Aldicarb (ug/sample)	(ug/m3)	*(pptv)
1	SJ1	3/24/97 11:30	3/25/97 11:00	1410	5.6	<LOD	<LOD	<LOD
2	HEL1	3/24/97 12:15	3/25/97 11:40	1405	5.6	<LOD	<LOD	<LOD
3	FP1	3/24/97 12:35	3/25/97 12:05	1410	5.6	<LOD	<LOD	<LOD
4	BUR1	3/24/97 13:30	3/25/97 12:45	1395	5.6	<LOD	<LOD	<LOD
5	ARB1	3/24/97 14:45	3/25/97 14:30	1425	5.7	<LOD	<LOD	<LOD
6	SJ2	3/25/97 11:00	3/26/97 09:00	1320	5.3	<LOD	<LOD	<LOD
7	HEL2	3/25/97 11:40	3/26/97 09:35	1315	5.3	<LOD	<LOD	<LOD
8	FP2	3/25/97 12:05	3/26/97 10:05	1320	5.3	<LOD	<LOD	<LOD
9	BUR2	3/25/97 12:45	3/26/97 10:35	1310	5.2	<LOD	<LOD	<LOD
10	ARB2	3/25/97 14:30	3/26/97 14:05	1415	5.7	<LOD	<LOD	<LOD
11	SJ3	3/26/97 09:00	3/27/97 08:30	1410	5.6	<LOD	<LOD	<LOD
12	SJ3D	3/26/97 09:00	3/27/97 08:30	1410	5.6	<LOD	<LOD	<LOD
13	HEL3	3/26/97 09:35	3/27/97 08:45	1390	5.6	<LOD	<LOD	<LOD
14	HEL3D	3/26/97 09:35	3/27/97 08:45	1390	5.6	<LOD	<LOD	<LOD
15	FP3	3/26/97 10:05	3/27/97 09:15	1390	5.6	<LOD	<LOD	<LOD
16	FP3D	3/26/97 10:05	3/27/97 09:15	1390	5.6	<LOD	<LOD	<LOD
17	BUR3	3/26/97 10:35	3/27/97 10:00	1405	5.6	<LOD	<LOD	<LOD
18	BUR3D	3/26/97 10:35	3/27/97 10:00	1405	5.6	<LOD	<LOD	<LOD
19	ARB3	3/26/97 14:05	3/27/97 12:00	1315	5.3	<LOD	<LOD	<LOD
20	ARB3D	3/26/97 14:05	3/27/97 12:00	1315	5.3	<LOD	<LOD	<LOD
21	B3	3/27/97 14:05	3/27/97 14:05	0	0.0	<LOD	NA	NA
22	SJ4	3/27/97 08:30	3/28/97 08:30	1440	5.8	<LOD	<LOD	<LOD
23	HEL4	3/27/97 08:45	3/28/97 09:00	1455	5.8	<LOD	<LOD	<LOD
24	FP4	3/27/97 09:15	3/28/97 09:20	1445	5.8	<LOD	<LOD	<LOD
25	BUR4	3/27/97 10:00	3/28/97 10:00	1440	5.8	<LOD	<LOD	<LOD
26	ARB4	3/27/97 12:00	3/28/97 07:30	1170	4.7	<LOD	<LOD	<LOD
27	SJ5	3/31/97 10:00	4/01/97 09:30	1410	5.6	<LOD	<LOD	<LOD
28	HEL5	3/31/97 10:30	4/01/97 10:00	1410	5.6	<LOD	<LOD	<LOD
29	FP5	3/31/97 11:00	4/01/97 10:25	1405	5.6	<LOD	<LOD	<LOD
30	BUR5	3/31/97 11:30	4/01/97 10:50	1400	5.6	<LOD	<LOD	<LOD
31	ARB5	3/31/97 13:30	4/01/97 12:45	1395	5.6	<LOD	<LOD	<LOD
32	SJ6	4/01/97 09:30	4/02/97 09:15	1425	5.7	<LOD	<LOD	<LOD
33	HEL6	4/01/97 10:00	4/02/97 09:45	1425	5.7	<LOD	<LOD	<LOD
34	FP6	4/01/97 10:25	4/02/97 10:10	1425	5.7	<LOD	<LOD	<LOD
35	BUR6	4/01/97 10:50	4/02/97 11:00	1450	5.8	<LOD	<LOD	<LOD
36	ARB6	4/01/97 12:45	4/02/97 13:35	1490	6.0	<LOD	<LOD	<LOD
37	SJ7	4/02/97 09:15	4/03/97 09:00	1425	5.7	<LOD	<LOD	<LOD
38	SJ7D	4/02/97 09:15	4/03/97 09:00	1425	5.7	<LOD	<LOD	<LOD
39	HEL7	4/02/97 09:45	4/03/97 10:00	1455	5.8	<LOD	<LOD	<LOD
40	HEL7D	4/02/97 09:45	4/03/97 10:00	1455	5.8	<LOD	<LOD	<LOD
41	FP7	4/02/97 10:10	4/03/97 10:25	1455	5.8	<LOD	<LOD	<LOD
42	FP7D	4/02/97 10:10	4/03/97 10:25	1455	5.8	<LOD	<LOD	<LOD
43	BUR7	4/02/97 11:00	4/03/97 11:30	1470	5.9	<LOD	<LOD	<LOD
44	BUR7D	4/02/97 11:00	4/03/97 11:30	1470	5.9	<LOD	<LOD	<LOD
45	ARB7	4/02/97 13:35	4/03/97 13:30	1435	5.7	<LOD	<LOD	<LOD
46	ARB7D	4/02/97 13:35	4/03/97 13:30	1435	5.7	<LOD	<LOD	<LOD
47	B-7	4/03/97 11:00	4/03/97 11:00	0	0.0	<LOD	NA	NA
48	SJ8	4/03/97 09:00	4/04/97 08:30	1410	5.6	<LOD	<LOD	<LOD
49	HEL8	4/03/97 10:00	4/04/97 09:05	1385	5.5	<LOD	<LOD	<LOD

LOD = 0.050 ug/sample
* pptv at 1 atm and 25 C
NA = Not Applicable

Table 9. Aldicarb Ambient Monitoring Results - Fresno County

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Volume (m3)	Aldicarb (ug/sample)	(ug/m3)	*(pptv)
50	FP8	4/03/97 10:25	4/04/97 09:30	1385	5.5	<LOD	<LOD	<LOD
51	BUR8	4/03/97 11:30	4/04/97 10:00	1350	5.4	<LOD	<LOD	<LOD
52	ARB8	4/03/97 13:30	4/04/97 12:00	1350	5.4	<LOD	<LOD	<LOD
53	SJ9	4/07/97 08:00	4/08/97 09:30	1530	6.1	<LOD	<LOD	<LOD
54	HEL9	4/07/97 08:15	4/08/97 09:50	1535	6.1	<LOD	<LOD	<LOD
55	FP9	4/07/97 08:30	4/08/97 10:10	1540	6.2	<LOD	<LOD	<LOD
56	BUR9	4/07/97 09:00	4/08/97 10:35	1535	6.1	<LOD	<LOD	<LOD
57	ARB9	4/07/97 11:10	4/08/97 12:30	1520	6.1	<LOD	<LOD	<LOD
58	SJ10	4/08/97 09:30	4/09/97 09:15	1425	5.7	<LOD	<LOD	<LOD
59	HEL10	4/08/97 09:50	4/09/97 09:30	1420	5.7	<LOD	<LOD	<LOD
60	FP10	4/08/97 10:10	4/09/97 10:05	1435	5.7	<LOD	<LOD	<LOD
61	BUR10	4/08/97 10:35	4/09/97 10:35	1440	5.8	<LOD	<LOD	<LOD
62	ARB10	4/08/97 12:30	4/09/97 12:25	1435	5.7	<LOD	<LOD	<LOD
63	SJ11	4/09/97 09:15	4/10/97 09:20	1445	5.8	<LOD	<LOD	<LOD
64	SJ11-D	4/09/97 09:15	4/10/97 09:20	1445	5.8	<LOD	<LOD	<LOD
65	HEL11	4/09/97 09:30	4/10/97 09:45	1455	5.8	<LOD	<LOD	<LOD
66	HEL11D	4/09/97 09:30	4/10/97 09:45	1455	5.8	<LOD	<LOD	<LOD
67	FP11	4/09/97 10:05	4/10/97 10:10	1445	5.8	<LOD	<LOD	<LOD
68	FP11D	4/09/97 10:05	4/10/97 10:10	1445	5.8	<LOD	<LOD	<LOD
69	BUR11	4/09/97 10:30	4/10/97 10:35	1445	5.8	<LOD	<LOD	<LOD
70	BUR11-D	4/09/97 10:30	4/10/97 10:35	1445	5.8	<LOD	<LOD	<LOD
71	ARB11	4/09/97 12:25	4/10/97 12:50	1465	5.9	<LOD	<LOD	<LOD
72	ARB11-D	4/09/97 12:25	4/10/97 12:50	1465	5.9	<LOD	<LOD	<LOD
73	SJ12	4/10/97 09:20	4/11/97 09:00	1420	5.7	<LOD	<LOD	<LOD
74	HEL12	4/10/97 09:45	4/11/97 09:25	1420	5.7	<LOD	<LOD	<LOD
75	FP12	4/10/97 10:10	4/11/97 09:45	1415	5.7	<LOD	<LOD	<LOD
76	BUR12	4/10/97 10:35	4/11/97 10:10	1415	5.7	<LOD	<LOD	<LOD
77	ARB12	4/10/97 12:50	4/11/97 11:40	1370	5.5	<LOD	<LOD	<LOD
78	B-12	4/11/97 09:45	4/11/97 09:45	0	0.0	<LOD	NA	NA

LOD = 0.050 ug/sample
* pptv at 1 atm and 25 C
NA = Not Applicable

Table 10. Aldicarb Ambient Monitoring Results - Kern County

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Volume (m3)	Aldicarb (ug/sample)	(ug/m3)	*(pptv)
79	WAS1	6/10/97 09:25	6/11/97 09:35	1450	5.8	<LOD	<LOD	<LOD
80	MCF1	6/10/97 10:11	6/11/97 09:00	1369	5.5	<LOD	<LOD	<LOD
81	MAP1	6/10/97 10:54	6/11/97 10:00	1386	5.5	<LOD	<LOD	<LOD
82	SEV1	6/10/97 11:26	6/11/97 10:22	1376	5.5	<LOD	<LOD	<LOD
83	BAK1	6/10/97 11:05	6/11/97 11:05	1440	5.8	<LOD	<LOD	<LOD
84	WAS2	6/11/97 09:35	6/12/97 09:40	1445	5.8	<LOD	<LOD	<LOD
85	WAS2D	6/11/97 09:35	6/12/97 09:40	1445	5.8	<LOD	<LOD	<LOD
86	MCF2	6/11/97 09:00	6/12/97 09:15	1455	5.8	<LOD	<LOD	<LOD
87	MCF2D	6/11/97 09:00	6/12/97 09:15	1455	5.8	<LOD	<LOD	<LOD
88	MAP2	6/11/97 10:00	6/12/97 10:19	1459	5.8	<LOD	<LOD	<LOD
89	MAP2D	6/11/97 10:00	6/12/97 10:19	1459	5.8	<LOD	<LOD	<LOD
90	SEV2	6/11/97 10:22	6/12/97 10:30	1448	5.8	<LOD	<LOD	<LOD
91	SEV2D	6/11/97 10:22	6/12/97 10:30	1448	5.8	<LOD	<LOD	<LOD
92	BAK2	6/11/97 11:05	6/12/97 11:15	1450	5.8	<LOD	<LOD	<LOD
93	BAK2D	6/11/97 11:05	6/12/97 11:15	1450	5.8	<LOD	<LOD	<LOD
94	BLNK1	6/12/97 09:40	6/12/97 09:40	0	0.0	<LOD	NA	NA
95	WAS3	6/12/97 09:40	6/13/97 10:45	1505	6.0	<LOD	<LOD	<LOD
96	MCF3	6/12/97 09:15	6/13/97 11:15	1560	6.2	<LOD	<LOD	<LOD
97	MAP3	6/12/97 10:19	6/13/97 10:35	1456	5.8	<LOD	<LOD	<LOD
98	SEV3	6/12/97 10:30	6/13/97 11:15	1485	5.9	<LOD	<LOD	<LOD
99	BAK3	6/12/97 11:15	6/13/97 09:35	1340	5.4	<LOD	<LOD	<LOD
100	MCF4	6/16/97 12:00	6/17/97 09:50	1310	5.2	<LOD	<LOD	<LOD
101	WAS4	6/16/97 12:33	6/17/97 10:20	1307	5.2	<LOD	<LOD	<LOD
102	MAP4	6/16/97 11:55	6/17/97 10:43	1368	5.5	<LOD	<LOD	<LOD
103	SEV4	6/16/97 13:10	6/17/97 11:00	1310	5.2	<LOD	<LOD	<LOD
104	BAK4	6/16/97 13:57	6/17/97 12:15	1338	5.4	<LOD	<LOD	<LOD
105	MCF5	6/17/97 09:50	6/18/97 10:20	1470	5.9	<LOD	<LOD	<LOD
106	WAS5	6/17/97 10:20	6/18/97 10:50	1470	5.9	<LOD	<LOD	<LOD
107	MAP5	6/17/97 10:43	6/18/97 11:15	1472	5.9	<LOD	<LOD	<LOD
108	SEV5	6/17/97 11:00	6/18/97 11:30	1470	5.9	<LOD	<LOD	<LOD
109	BAK5	6/17/97 12:15	6/18/97 12:38	1463	5.9	<LOD	<LOD	<LOD
110	MCF6	6/18/97 10:20	6/19/97 12:30	1570	6.3	<LOD	<LOD	<LOD
111	MCF6D	6/18/97 10:20	6/19/97 12:30	1570	6.3	<LOD	<LOD	<LOD
112	WAS6	6/18/97 10:50	6/19/97 10:37	1427	5.7	<LOD	<LOD	<LOD
113	WAS6D	6/18/97 10:50	6/19/97 10:37	1427	5.7	<LOD	<LOD	<LOD
114	MAP6	6/18/97 11:15	6/19/97 10:57	1422	5.7	<LOD	<LOD	<LOD
115	MAP6D	6/18/97 11:15	6/19/97 10:57	1422	5.7	<LOD	<LOD	<LOD
116	SEV6	6/18/97 11:30	6/19/97 11:12	1422	5.7	<LOD	<LOD	<LOD
117	SEV6D	6/18/97 11:30	6/19/97 11:12	1422	5.7	<LOD	<LOD	<LOD
118	BAK6	6/18/97 12:38	6/19/97 11:47	1389	5.6	<LOD	<LOD	<LOD
119	BAK6D	6/18/97 12:38	6/19/97 11:47	1389	5.6	<LOD	<LOD	<LOD
120	MCF7	6/19/97 12:30	6/20/97 09:48	1278	5.1	<LOD	<LOD	<LOD
121	WAS7	6/19/97 10:37	6/20/97 09:15	1358	5.4	<LOD	<LOD	<LOD
122	MAP7	6/19/97 10:57	6/20/97 08:57	1320	5.3	<LOD	<LOD	<LOD
123	SEV7	6/19/97 10:57	6/20/97 08:40	1303	5.2	<LOD	<LOD	<LOD
124	BAK7	6/19/97 10:37	6/20/97 07:55	1278	5.1	<LOD	<LOD	<LOD
125	BLNK2	6/19/97 12:30	6/19/97 12:30	0	0.0	<LOD	NA	NA
126	MCF8	6/23/97 11:00	6/24/97 09:00	1320	5.3	<LOD	<LOD	<LOD
127	WAS8	6/23/97 11:30	6/24/97 09:35	1325	5.3	<LOD	<LOD	<LOD

LOD = 0.050 ug/sample
* pptv at 1 atm and 25 C
NA = Not Applicable

Table 10. Aldicarb Ambient Monitoring Results - Kern County

Log #	Sample ID	Start Date/Time	End Date/Time	Sample Time (min.)	Sample Volume (m3)	Aldicarb (ug/sample)	(ug/m3)	*(pptv)
128	MAP8	6/23/97 11:50	6/24/97 09:55	1325	5.3	<LOD	<LOD	<LOD
129	SEV8	6/23/97 12:05	6/24/97 09:15	1270	5.1	<LOD	<LOD	<LOD
130	BAK8	6/23/97 13:00	6/24/97 10:00	1260	5.0	<LOD	<LOD	<LOD
138	MCF9	6/24/97 09:00	6/25/97 09:00	1440	5.8	<LOD	<LOD	<LOD
139	WAS9	6/24/97 09:35	6/25/97 09:30	1435	5.7	<LOD	<LOD	<LOD
140	MAP9	6/24/97 09:55	6/25/97 09:55	1440	5.8	<LOD	<LOD	<LOD
141	SEV9	6/24/97 09:15	6/25/97 10:15	1500	6.0	<LOD	<LOD	<LOD
142	BAK9	6/24/97 10:00	6/25/97 11:00	1500	6.0	<LOD	<LOD	<LOD
145	MCF10	6/25/97 09:00	6/26/97 09:00	1440	5.8	<LOD	<LOD	<LOD
146	MCF10D	6/25/97 09:00	6/26/97 09:00	1440	5.8	<LOD	<LOD	<LOD
147	WAS10	6/25/97 09:30	6/26/97 09:40	1450	5.8	<LOD	<LOD	<LOD
148	WAS10D	6/25/97 09:30	6/26/97 09:40	1450	5.8	<LOD	<LOD	<LOD
149	MAP10	6/25/97 09:55	6/26/97 10:00	1445	5.8	<LOD	<LOD	<LOD
150	MAP10D	6/25/97 09:55	6/26/97 10:00	1445	5.8	<LOD	<LOD	<LOD
151	SEV10	6/25/97 10:15	6/26/97 10:25	1450	5.8	<LOD	<LOD	<LOD
152	SEV10D	6/25/97 10:15	6/26/97 10:25	1450	5.8	<LOD	<LOD	<LOD
153	BAK10	6/25/97 11:00	6/26/97 11:00	1440	5.8	<LOD	<LOD	<LOD
154	BAK10D	6/25/97 11:00	6/26/97 11:00	1440	5.8	<LOD	<LOD	<LOD
155	BLNK	6/25/97 09:00	6/25/97 09:00	0	0.0	<LOD	NA	NA
157	MCF11	6/26/97 09:00	6/27/97 11:35	1595	6.4	<LOD	<LOD	<LOD
158	WAS11	6/26/97 09:40	6/27/97 11:10	1530	6.1	<LOD	<LOD	<LOD
159	MAP11	6/26/97 09:55	6/27/97 10:40	1485	5.9	<LOD	<LOD	<LOD
160	SEV11	6/26/97 10:25	6/27/97 10:15	1430	5.7	<LOD	<LOD	<LOD
161	BAK11	6/26/97 11:00	6/27/97 09:30	1350	5.4	<LOD	<LOD	<LOD

LOD = 0.050 ug/sample
* pptv at 1 atm and 25 C
NA = Not Applicable

Table 11. Aldicarb *Application #1 Lab* Spike Results

Sample ID	*Aldicarb Mass (ug)	Expected Mass (ug)	Percent Recovery
LS1	0.594	0.70	85%
LS2	0.604	0.70	86%
LS3	0.594	0.70	85%
LS4	0.603	0.70	86%

Table 12. Aldicarb *Application #1 Trip* Spike Results

Sample ID	*Aldicarb Mass (ug)	Expected Mass (ug)	Percent Recovery
TS1	0.545	0.70	78%
TS2	0.653	0.70	93%
TS3	0.504	0.70	72%
TS4	0.532	0.70	76%

Table 13. Aldicarb *Application #1 Field* Spike Results

Sample ID	*Aldicarb Mass (ug)	Background* * Mass (ug)	Corrected Mass (ug)	Expected Amount (ug)	Percent Recovery
WFS1	0.671	<LOD	0.671	0.70	96%
SFS2	0.668	<LOD	0.668	0.70	95%
EFS3	0.627	<LOD	0.627	0.70	90%
NFS4	0.552	<LOD	0.552	0.70	79%

LOD = 0.050 ug sample

*The sum of aldicarb, aldicarb sulfoxide and aldicarb sulfone.

**The mass of aldicarb found in the colocated sample.

Table 14. Aldicarb *Application #2 Lab* Spike Results

Sample ID	*Aldicarb Mass (ug)	Expected Mass (ug)	Percent Recovery
LS1	0.564	0.70	81%
LS2	0.860	0.70	123%
LS3	0.556	0.70	79%
LS4	0.561	0.70	80%

Table 15. Aldicarb *Application #2 Trip* Spike Results

Sample ID	*Aldicarb Mass (ug)	Expected Mass (ug)	Percent Recovery
TS1	0.807	0.70	115%
TS2	0.603	0.70	86%
TS3	0.641	0.70	92%
TS4	0.720	0.70	103%

Table 16. Aldicarb *Application #2 Field* Spike Results

Sample ID	*Aldicarb Mass (ug)	Background* * Mass (ug)	Corrected Mass (ug)	Expected Amount (ug)	Percent Recovery
WFS1	0.764	<LOD	0.764	0.70	109%
SFS2	0.834	***Det.	0.724	0.70	103%
EFS3	0.720	<LOD	0.720	0.70	103%
NFS4	0.729	<LOD	0.729	0.70	104%

LOD = 0.050 ug/sample
*The sum of aldicarb, aldicarb sulfoxide and aldicarb sulfone.
**The mass of aldicarb found in the colocated sample.
***Used (LOD+LOQ)/2 = 0.11 ug/sample for correction.

Table 17. Aldicarb *Ambient Lab* Spike Results

Sample ID	*Aldicarb Mass (ug)	Expected Mass (ug)	Percent Recovery
TS1	0.641	0.70	92%
TS2	0.686	0.70	98%
TS3	0.684	0.70	98%
TS4	0.669	0.70	96%
TS5	0.715	0.70	102%

Table 18. Aldicarb *Ambient Trip* Spike Results

Sample ID	*Aldicarb Mass (ug)	Expected Mass (ug)	Percent Recovery
BAK-T1	0.614	0.70	88%
BAK-T2	0.652	0.70	93%
BAK-T3	0.652	0.70	93%
BAK-T4	0.682	0.70	97%
BAK-T5	0.586	0.70	84%

Table 19. Aldicarb *Ambient Field* Spike Results

Sample ID	*Aldicarb Mass (ug)	Background* * Mass (ug)	Corrected Mass (ug)	Expected Mass (ug)	Percent Recovery
BAK-8S1	0.767	<LOQ	0.767	0.70	110%
BAK-8S2	0.625	<LOQ	0.625	0.70	89%
BAK-9S3	0.697	<LOQ	0.697	0.70	100%
BAK-9S4	0.119	<LOQ	0.119	0.70	17%
BAK-10S5	0.677	<LOQ	0.677	0.70	97%

LOD = 0.050 ug/sample

*The sum of aldicarb, aldicarb sulfoxide and aldicarb sulfone.

**The mass of aldicarb found in the colocated sample.